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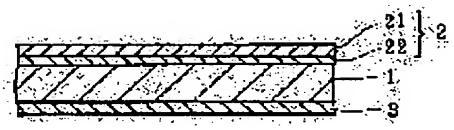
(54) SHEET FOR PROTECTING WATERPROOF LAYER

(57)Abstract:
PURPOSE: To obtain a sheet for protecting a waterproof layer which can dispense with release paper and can show tight adhesiveness even at low temperatures in winter by laminating a reinforcement on one surface of a foamed sheet and forming a layer of a normally nonadhesive heat-bondable rubber adhesive on the other surface.
CONSTITUTION: A reinforcement 2 is laminated on one surface of a foamed sheet (e.g. foamed sheet of cross-linked polyethylene). A suitable example of the reinforcement 2 is one prepared by laminating a 30μm-thick low-density polyethylene film 22 on rectangularly crossing nonwoven fabric obtained by superposing a set of parallel yarns formed by treating a uniaxially oriented high-density polyethylene film in the direction of orientation in a count of 10 yarns/inch upon another set of such yarns in such a manner that the yarns of one set cross rectangularly to the yarns of the other and bonding their points of crossing. A layer 3 of a normally nonadhesive heat-bonding rubber adhesive (e.g. styrene/butadiene copolymer rubber) is formed on the other surface of the foamed sheet 1 to produce the objective sheet.



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CLAIMS

[Claim(s)]
[Claim 1] the water-resistant-layer protection sheet with which the laminating of the reinforcing materials is carried out to one side of a foaming sheet, this foaming sheet is alike on the other hand with a sheet, and it comes to prepare the elastomeric adhesive layer of a heat adhesive property which is a non-adhesive property in ordinary temperature.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to the water-resistant-layer protection sheet for protecting the water resistant layer used for concrete or a murbruk structure object.
[0002]
[Description of the Prior Art] In construction and waterfront reclamation work of the RWY of an airport, as for the trunk of supplies, such as the utility supporting an airport facility or the function of waterfront, i.e., the electrical and electric equipment, water and sewage, and a fuel, most is laid under the bottom of the road of a driveway and a foot walk as a pipe utility conduit. Thus, a pipe utility conduit is the concrete structure and a water resistant layer is prepared in a periphery to permeation of an underground water, storm sewage, etc. for underground installation. Asphalt is used as this water resistant layer.
[0003] A protection sheet is covered by the asphalt sheet front face in order to protect an asphalt sheet from damage by damage by earth and sand, a crushed stone, etc. of backfilling, the earth pressure after construction, an earthquake, etc., since a pipe utility conduit is installed in the earth and returned. Conventionally, it excels in impact absorptivity, workability is also good, and since it is lightweight, the foaming sheet with which the laminating of the cross which becomes the whole surface of polyethylene foam from a polyethylene fiber was carried out as a protection sheet is used widely. In order to carry out the laminating of this foaming sheet to an asphalt sheet front face, an asphalt sheet and a foaming sheet surface are heated to coincidence, and are stuck.
[0004] Moreover, a pressure-sensitive binder layer is prepared in the foaming sheet of polyethylene, the thing which comes to carry out the laminating of the releasing paper to this binder layer is faced covering, and a releasing paper is stripped off, and a binder layer is pasted up on a water-proofing side, and it is used.
[0005] Moreover, the tarpaulin with an adhesive layer which comes to form the binder which makes the compound which uses isobutylene isoprene rubber or halogenation isobutylene isoprene rubber, a non-cross-linking polymeric material, etc. as a principal component come to construct a bridge over JP,59-136246,A in one side, such as a chlorination vinyl sheet and a polyolefine system sheet, is indicated.
[0006]
[Problem(s) to be Solved by the Invention] Since there is no glue line in any field, the tarpaulin with which it comes to carry out the laminating of an asphalt layer and the cloth to a foaming sheet which is used from the above-mentioned former cannot be pasted up if heating fusion of an asphalt front face and the foaming sheet front face is not carried out. However, if heating fusion of the foaming sheet is carried out, the thickness of a foaming sheet will decrease and impact absorptivity will fall.
[0007] It is easy to slide and is dangerous because of the releasing paper which the pressure-sensitive binder layer was prepared in the foaming sheet of polyethylene, and the releasing paper which exfoliated when the thing which comes to carry out the laminating of the releasing paper to this binder layer was used, and using it became a contaminant, required the time and effort which processes this, and were scattered on the work site.

[0008] Moreover, a tarpaulin given [above-mentioned] in an official report needs to apply the conventional adhesives to a concrete side, in order to make it get used to a concave convex well and to fully obtain adhesion area, although it aims at that raise thermal resistance and adhesive strength does not decline in about 80 degrees C, and improving the concordance of an adhesive layer even if the concrete which is a covering side is a concave convex. Furthermore, since the non-cross-linking high polymer is blended, since adhesiveness is shown also in ordinary temperature, it is necessary to carry out the laminating of the releasing paper to an adhesive layer side, and there is the same problem as said conventional tarpaulin.
[0009] This invention cancels the above-mentioned conventional trouble, and does not need a releasing paper, but also under the low temperature of winter, to a concave convex, concordance is good and it aims at offering the tarpaulin which can demonstrate strong adhesive strength.
[0010]
[Means for Solving the Problem] the laminating of the reinforcing materials is carried out to one side of a foaming sheet, on the other hand, this foaming sheet boils this invention tarpaulin, and it is characterized by coming to prepare the elastomeric adhesive layer of a heat adhesive property which is a non-adhesive property in ordinary temperature.
[0011] Although synthetic-resin foaming sheets, such as a simple substance of polyethylene and polypropylene or mixture and a foaming sheet that comes to blend an ethylene-vinylacetate copolymer etc. with these, a vinyl chloride, and an acrylic, are mentioned as a foaming sheet, it is cheap and what makes a subject the polyethylene system resin which was easy to manufacture and was excellent in workability is desirable.
[0012] In the case of polyethylene system resin, as a foaming sheet, that [air bubbles'] over which the bridge was constructed is fine, and uniform, and since it excels also in reinforcement and thermal resistance, it is desirable. From the point of reinforcement, cushioning properties, and workability, if the 20 to 40 times as many thing of expansion ratio as this is lower than 20 desirable times, cushioning properties are insufficient for it, and there are few protective effects, and reinforcement will become weak, if workability worsens and exceeds 40 times, since it becomes hard. Moreover, the about 3-10mm thing of thickness is desirable. If thinner than 3mm, cushioning properties and reinforcement run short, and if it exceeds 10mm, workability will worsen.
[0013] The circumstances rectangular cross nonwoven fabric which make the yarn which tore the high density polyethylene film extended, for example fibrous along the extension direction intersect perpendicularly, and it comes to paste the intersection is light, and reinforcement is size, and since it is easy to paste up reinforcing materials on a foaming sheet, they are practical and desirable. Cloth, a nonwoven fabric, etc. using plastic fiber, a glass fiber, etc. as other things can also be used.
[0014] In order to carry out the laminating of the reinforcing materials to a foaming sheet, the adhesion using the extrusion lamination and hot melt adhesive which are regularly used as a laminating means etc. is adopted.
[0015] The elastomeric adhesive layer formed in other fields of the above-mentioned foaming sheet is a thing of a heat adhesive property which is a non-adhesive property in ordinary temperature, a synthetic-rubber system or natural rubber is used as the base, and the thing of a solvent system is used. As rubber used for these adhesives, things generally used as adhesives, such as styrene-styrene-butadiene-rubber copolymer rubber besides natural rubber, a styrene-isoprene-styrene copolymer, nitrile rubber, and chloroprene rubber, are mentioned, and it can be used if support nature is made [in / it is good and / ordinary temperature] with a non-adhesive property to a polyethylene foaming sheet front face.
[0016] Although a tackifier etc. is suitably blended with the above-mentioned elastomeric adhesive, in ordinary temperature, it activates by heating, in case it is not necessary to carry out the laminating of the releasing paper and it is stuck on adherend, since it is a non-adhesive property, and adhesive strength is produced. Since the efficiency of construction will worsen and this activation temperature will damage the foaming structure of a foaming sheet if it is not much high, its about 80 degrees C are desirable.
[0017]
[Function] In ordinary temperature, the elastomeric adhesive used for the tarpaulin of this invention is a

non-adhesive property, and it activates by heating, in case it sticks on adherend, and it produces adhesive strength. And after sticking on adherend, it cools and solidifies and a firm adhesion condition is acquired, and adhesive strength strong also under the low temperature of winter is demonstrated. Moreover, since a base material is a foaming sheet, it is easy to get used to a concave convex.
[0018] Good cushioning properties can be maintained without crushing foaming structure, even if it uses a polyethylene foaming sheet since the activation temperature of elastomeric adhesive is lower than the melting temperature of polyethylene.
[0019] Moreover, in ordinary temperature, since adhesives are non-adhesive properties, they do not have to carry out the laminating of the releasing paper, and its processing of a releasing paper is unnecessary. Furthermore, since a base material is a foaming sheet, adiathermic and cushioning properties are good, a foaming sheet is not torn by reinforcing materials, but handling is easy.
[0020]
[Example] Next, the example of this invention tarpaulin is explained with reference to a drawing. Drawing 1 is the sectional view showing the example of this invention tarpaulin. On one side of the foaming sheet 1 (the Sekisui Chemical [Co., Ltd.] make, a trade name: SOFUTORON, expansion ratio of 30 times, thickness of 6mm) of cross-linked polyethylene What arranged in parallel the yarn which tore apart the high density polyethylene film which carried out uniaxial stretching along the extension direction by the inch in ten [/] is made to intersect perpendicularly in the direction in every direction. The laminating of the low consistency polyethylene film 22 with a thickness of 30 micrometers and the reinforcing materials 2 who come to laminate is carried out to the circumstances rectangular cross nonwoven fabric 21 which it comes to paste the intersection of these yarn by thermal melting arrival.
[0021] In the reinforcing materials 2 of the above-mentioned foaming sheet 1, the synthetic-rubber system adhesives (the Sekisui Chemical Co., Ltd. make, trade name:S dyne 280PN-1, heat activity temperature of 80 degrees C) of the solvent mold which consists of styrene-Butadiene Styrene are applied and dried with a gravure roll by the opposite side, and it comes to form the adhesives layer 3 with a thickness of 6 micrometers of a heat adhesive property in it.
[0022] The adhesives layer 3 of the above-mentioned heat adhesive property was heated in skin temperature of 80 degrees C with the dryer of 1kw, and it stuck on the water resistant layer (the Tajima roofing company make, a trade name: 3 star GAMURON fault B) (illustration abbreviation) with a thickness of 3mm it is thin from the mixture of sand and asphalt by hand. It softened, shortly after heating, and the adhesives layer got used to a waterproofing stratification plane well, and was pasted up on it. After the temperature of an adhesives layer fell, although exfoliation of a foaming sheet was tried, adhesive strength was strong, and could not exfoliate, but the foaming sheet broke between layers.
[0023]
[Effect of the Invention] Since this invention tarpaulin is the above configuration, adhesives are rubber systems and it is activated at temperature lower than the melting temperature of a foaming sheet, it gets used to the concave convex of adherend well, and can stick on it, without destroying foaming structure, and, for this reason, adhesive strength strong also under the low temperature of winter can be demonstrated. It is not necessary to cool and solidify and for a firm adhesion condition to be acquired, after sticking on adherend, and to carry out heating fusion of the water resistant layer which is adherend.

[0024] Moreover, in ordinary temperature, since elastomeric adhesive is a non-adhesive property, it does not have to carry out the laminating of the releasing paper, and its processing of a releasing paper is unnecessary. Furthermore, since a base material is a foaming sheet, adiathermic and cushioning properties are good, since the laminating of the reinforcing materials is carried out, a foaming sheet is not torn but handling is easy.
[0025]

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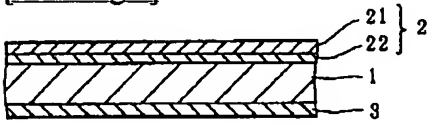
DRAWINGS

[Drawing 1]



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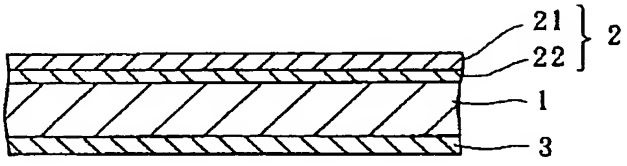
(54)【発明の名称】　防水層保護シート

(57)【要約】

【目的】　剥離紙を必要とせず、冬季の低温下でも凹凸面に対してなじみがよく、強い接着力を発揮し得る防水シートを提供する。

【構成】　架橋ポリエチレンの発泡シート１（発泡倍率３０倍，厚み６mm）の片面に、一軸延伸した高密度ポリエチレンからなる経緯直交不織布２１に厚み３０μmの低密度ポリエチレンフイルム２２とラミネートしてなる補強材２が熱融着により積層され、該補強材２とは反対側に、スチレンーブタジエンースチレン共重合体からなる溶剤型の合成ゴム系接着剤（熱活性温度８０℃）がグラビアロールで塗布、乾燥されて厚み６μmの熱接着性の接着剤層３が形成されてなる。



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【特許請求の範囲】

【請求項１】　発泡シートの片面に補強材が積層され、該発泡シートの他面に常温において非接着性である熱接着性のゴム系接着剤層が設けられてなる防水層保護シート。

【発明の詳細な説明】

【０００１】

【産業上の利用分野】本発明はコンクリートもしくはモルタル構造物に用いられる防水層を保護するための防水層保護シートに関する。

【０００２】

【従来の技術】空港の滑走路の建設やウォーターフロント開拓事業において、空港設備やウォーターフロントの機能を支えるユーティリティ、即ち、電気、上下水道及び燃料等供給の幹線は、殆どが共同溝として車道・歩道の道路下に埋設される。このように共同溝はコンクリート構造物であり、地下設置のため地下水や雨水等の浸入に対し外周に防水層が設けられる。この防水層としてアスファルトが用いられている。

【０００３】共同溝は地中に設置して埋め戻されるので、埋め戻しの土砂や砕石等による損傷や、施工後の土圧、地震等による損傷からアスファルトシートを保護するために、アスファルトシート表面に保護シートが被覆される。従来、保護シートとして、例えば発泡ポリエチレンの一面にポリエチレン繊維からなるクロスが積層された発泡シートが衝撃吸収性にすぐれ、加工性もよく、軽量であるため広く用いられている。該発泡シートをアスファルトシート表面に積層するには、アスファルトシートと発泡シート面とを同時に加熱して貼り合わせていた。

【０００４】又、ポリエチレンの発泡シートに感圧性粘着剤層が設けられ、該粘着剤層に剥離紙が積層されてなるものを、被覆するに際して剥離紙を剥ぎ取り、粘着剤層を防水処理面に接着して用いられている。

【０００５】又、特開昭５９－１３６２４６号公報には、ブチルゴムないしはハロゲン化ブチルゴム、非架橋性高分子物質などを主成分とする配合物を架橋させてなる粘着剤を塩化ビニルシートやポリオレフィン系シート等の片面に形成してなる粘着層付き防水シートが開示されている。

【０００６】

【発明が解決しようとする課題】上記従来から使用されているような発泡シートにアスファルト層と布が積層されてなる防水シートは、いずれの面にも接着層がないので、アスファルト表面と発泡シート表面を加熱溶融しなければ接着することができない。しかし、発泡シートを加熱溶融すると発泡シートの厚みが減少して衝撃吸収性が低下する。

【０００７】ポリエチレンの発泡シートに感圧性粘着剤層が設けられ、該粘着剤層に剥離紙が積層されてなるものを用いると、使用する際に剥離された剥離紙がごみとなり、これを処理する手間を要し、作業現場に散乱した剥離紙のために滑り易くて危険である。

【０００８】又、上記公報記載の防水シートは、耐熱性を高めて８０℃程度においても接着力が低下しないことと、被着面であるコンクリートが凹凸面であっても粘着層のなじみをよくすることを目的とするものであるが、凹凸面によくなじませて接着面積を十分に得るためには、コンクリート面に従来の接着剤を塗布する必要がある。更に、非架橋性高分子物質が配合されているため、常温においても粘着性を示すので粘着層面に剥離紙を積層する必要があり、前記従来の防水シートと同様の問題がある。

【０００９】本発明は上記従来の問題点を解消し、剥離紙を必要とせず、冬季の低温下でも凹凸面に対してなじみがよく、強い接着力を発揮し得る防水シートを提供することを目的とする。

【００１０】

【課題を解決するための手段】本発明防水シートは、発泡シートの片面に補強材が積層され、該発泡シートの他面に常温において非接着性である熱接着性のゴム系接着剤層が設けられてなることを特徴とするものである。

【００１１】発泡シートとしては、ポリエチレン、ポリプロピレンの単体もしくは混合物、又、これらにエチレン－酢酸ビニル共重合体等を配合してなる発泡シート、塩化ビニル、アクリル等の合成樹脂発泡シートが挙げられるが、安価であり、製造し易く、加工性にすぐれたポリエチレン系樹脂を主体とするものが好ましい。

【００１２】ポリエチレン系樹脂の場合、架橋されたものが発泡シートとして気泡が細かくて均一であり、強度及び耐熱性にもすぐれているので好ましい。発泡倍率は強度、クッション性、作業性の点から２０～４０倍のものが好ましい、２０倍よりも低いとクッション性が不足して保護効果が少なく、硬くなるので作業性が悪くなり、４０倍を超えると強度が弱くなる。又、厚みは３～１０mm程度のものが好ましい。３mmよりも薄いとクッション性、強度が不足し、１０mmを超えると作業性が悪くなる。

【００１３】補強材は、例えば延伸した高密度ポリエチレンフイルムを延伸方向に沿って繊維状に引き裂いたヤーンを直交させ、その交点を接着してなる経緯直交不織布などが軽くて強度が大であり、発泡シートに接着し易いので実用的で好ましい。他のものとしては、合成樹脂繊維、ガラス繊維等を用いた布や不織布等を用いることもできる。

【００１４】補強材を発泡シートに積層するには、積層手段として常用されている押出しラミネートやホットメルト接着剤を用いた接着などが採用される。

【００１５】上記発泡シートの他の面に形成されるゴム系接着剤層は、常温において非接着性である熱接着性の

ものであり、合成ゴム系或いは天然ゴムをベースとするもので溶剤系のものが用いられる。この接着剤に用いられるゴムとしては、天然ゴムの他、スチレンーブタジエンースチレン共重合体ゴム、スチレンーイソプレンースチレン共重合体、ニトリルゴム、クロロプレンゴム等一般に接着剤として用いられているものが挙げられ、ポリエチレン発泡シート表面に対してアンカー性がよく、常温において非接着性とできるものであれば使用できる。

【００１６】上記ゴム系接着剤には粘着付与樹脂などが適宜配合されるが、常温では非接着性であるから剥離紙を積層する必要はなく、被着体に貼り付ける際に加熱することにより活性化されて接着力を生ずる。この活性化温度はあまり高いと施工の能率が悪くなり、発泡シートの発泡構造を損傷するので約８０℃程度が好ましい。

【００１７】

【作用】本発明の防水シートに用いるゴム系接着剤は常温では非接着性であり、被着体に貼り付ける際に加熱することにより活性化されて接着力を生ずる。そして被着体に貼り付けた後は冷却して固化し強固な接着状態が得られ、冬季の低温下でも強い接着力を発揮する。又、支持体が発泡シートであるから凹凸面になじみ易い。

【００１８】ゴム系接着剤の活性化温度はポリエチレンの溶融温度よりも低いので、ポリエチレン発泡シートを用いても発泡構造が潰れることなく、良好なクッション性を維持できる。

【００１９】又、接着剤は常温では非接着性であるから剥離紙を積層する必要はなく、剥離紙の処理が不要である。更に、基材が発泡シートであるから断熱性とクッション性がよく、補強材により発泡シートが破れたりせず取扱いが容易である。

【００２０】

【実施例】次に、本発明防水シートの実施例を図面を参照して説明する。図１は本発明防水シートの実施例を示す断面図であり、架橋ポリエチレンの発泡シート１（積水化学工業社製，商品名：ソフトロン，発泡倍率３０倍，厚み６mm）の片面に、一軸延伸した高密度ポリエチレンフイルムを延伸方向に沿って切り裂いたヤーンを１０本／インチで並列したものを縦横方向に直交させ、これらヤーンの交点を接着してなる経緯直交不織布２１に厚み３０μmの低密度ポリエチレンフイルム２２とラミネートしてなる補強材２が熱融着により積層されたものである。

【００２１】上記発泡シート１の補強材２とは反対側に、スチレンーブタジエンースチレン共重合体からなる溶剤型の合成ゴム系接着剤（積水化学工業社製，商品名：エスダイン２８０ＰＮ－１，熱活性温度８０℃）がグラビアロールで塗布、乾燥されて厚み６μmの熱接着性の接着剤層３が形成されてなる。

【００２２】上記熱接着性の接着剤層３を１kwのドライヤーで表面温度８０℃に加熱し、砂とアスファルトとの混合物からなる厚み３mmの防水層（田島ルーフィング社製，商品名：三星ガムロンフォルトＢ）（図示略）に手で貼り付けた。接着剤層は加熱するとすぐに軟化し、防水層面によくなじんで接着した。接着剤層の温度が低下した後、発泡シートの剥離を試みたが接着力が強くて剥離できず、発泡シートが層間で破壊した。

【００２３】

【発明の効果】本発明防水シートは以上の構成であり、接着剤はゴム系であるから発泡シートの溶融温度よりも低い温度で活性化するので、発泡構造を破壊せずに被着体の凹凸面によくなじんで貼り付けることができ、このため冬季の低温下でも強い接着力を発揮できる。被着体に貼り付けた後は冷却して固化し強固な接着状態が得られ、被着体である防水層を加熱溶融する必要がない。

【００２４】又、ゴム系接着剤は常温では非接着性であるから剥離紙を積層する必要はなく、剥離紙の処理が不要である。更に、基材が発泡シートであるから断熱性とクッション性がよく、補強材が積層されているので発泡シートが破れたりせず取扱いが容易である。

【００２５】

【図面の簡単な説明】

【図１】本発明防水シートの実施例を示す断面図。

【符号の説明】

１：発泡シート

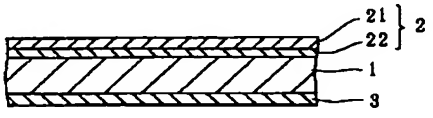
２：補強材

３：接着剤層

２１：不織布

２２：低密度ポリエチレンフイルム

【図１】



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